

REMARKS

Applicants have carefully reviewed and considered the Examiner's Office Action dated December 7, 2006. Reconsideration is respectfully requested in view of the following comments.

By this Amendment, claims 1-3, 6 and 9 are amended. Accordingly, Claims 1-4, 6-7 and 9 are pending in this application, with claims 1-3, 6-7 and 9 currently under examination.

Claim 6 was rejected under 35 U.S.C. §112, first paragraph for the reasons set forth in the middle of page 2 of the Action. By the foregoing amendments to claim 6, the objected to terminology is replaced with the originally-filed language. Figures 4b and 5b show with arrows that because of reference character 26 or blockage 26, the two streams of flow (a primary flow from first opening 21 and a second flow from opening 25) are directed to join each other in the same circumferential direction. Accordingly, it is submitted that claim 6 fully complies with the written description requirement and that rejection should be withdrawn.

Claims 1-4, 6, 7 and 9 were rejected under 35 U.S.C. §112, second paragraph for the reasons described at the top of page 4 of the Action. The claims have been amended taking into consideration the Examiner's comments.

In particular, Claim 1 has been changed to clarify that the two alternative primary air inlet configurations are: 1) the height of each entry annular opening is a fraction of a height (h) of an entry opening required for a given mill output, while the width (w) of each entry annular opening remains the same as a width (w) of the entry opening required for the given mill output; OR 2) the height (h') of each entry annular opening (18', 18") is

a fraction of a height (h) of an entry opening required for a given mill output and the width (w') of each entry annular opening is a fraction of a width (w) of the entry opening required for the given mill output, such that the summation of the product (area) of the height and width of each entry annular opening of the multiple entry annular openings is equal to the product (area) of the height (h) and width (w) of the entry opening required for a given mill output. That is, claim 1 does not recite that the height of the opening varies per configuration, but that, for example, height (h_2) is half of the height used in the prior art so that the total opening of both annular openings is about half the area of the inlet used to obtain a mill output in the prior art (Figure 3a); or, as shown in Figure 3b, the height and width of the annular opening may vary from the prior art to create an area of inlet, which is half the area of entry in the one-annular entry prior art of Figure 2.

With respect to claim 3, it states a configuration where the area of the inlet for each annular opening is defined by the number entry annular openings proposed. In other words, claim 3 recites multiple entry annular openings where cross-sectional area of each opening is determined by dividing the desired given mill output by the number of entry annular openings proposed. Claim 3 did not recite that the recited openings of the bowl mill were variable. To the contrary, claim 3 recited that the configuration is a fraction of a single entry configuration (prior art of Figure 2 as the recited claim has multiple annular openings).

Claim 9 has been amended to clarify that the recited arrangement that has a partition so half of the primary flow of air enters the interior of the air mill at opening 21 and the second half enters the interior of the air mill at opening 25, which is set 180 degrees apart from opening 21. That is, the air flow enters the air mill at single inlet, but

the air flow is divided so that half reaches the interior of the air mill at one point (opening 21) and the other half reaches the interior of the air mill at a second point (opening 25).

In view of the amendments to claims 1, 3, and 9 and the foregoing comments, claims 1-4, 6, 7, and 9 are fully definite under 35 U.S.C. §112, second paragraph. Withdrawal of this rejection is respectfully requested.

Claims 1-3 and 9 were rejected under 35 U.S.C. §102 (b) as being anticipated by U.S. Patent No. 2,909,330 to Hardinge. This rejection is respectfully traversed.

Hardinge is directed a pulverizing mill and process of pulverizing material that introduces air into the casing 12 through suitable inlet ports 78 near base 10. There is no disclosure of an air mill having an entry opening forming an area based on a desired or given mill output as Figure 2 of Hardinge shows a rectangular opening 78. In column 8, lines 5-12 of Hardinge, no reference is made to the area of openings 78, which is essential for the proper working of the pulverizer. Claim 1 recites two alternative air mill openings: 1) the height of each entry annular opening is a fraction of a height (h) of an entry opening required for a given mill output, while the width (w) of each entry annular opening remains the same as a width (w) of the entry opening required for the given mill output; OR 2) the height (h') of each entry annular opening (18', 18") is a fraction of a height (h) of an entry opening required for a given mill output and the width (w') of each entry annular opening is a fraction of a width (w) of the entry opening required for the given mill output, such that the summation of the product (area) of the height and width of each entry annular opening of the multiple entry annular openings is equal to the product (area) of the height (h) and width (w) of the entry opening required for a given mill output. These recited annular openings produce a result: where the air streams from

the two separate Hardinge simply discloses that air may be introduced through “any suitable inlet ports” (column 8, lines 5-6) and provides no disclosure that the area of the opening is based on the desired or given mill output, such as provided in the prior art (Figure 2 of the present application). While Hardinge discloses two inlets, there is no disclosure that proper input flow would come through openings disclosed by Hardinge. It is respectfully submitted that a capability of providing annular openings with the recited configurations would require undue experimentation. Consequently, Hardinge cannot anticipate claim 1 as the recited annular openings have a height and a width based on a desired or given amount of mill output so that the bowl mill results “in better uniformity in air flow around the air mill section and [minimizes] formation of eddies and vortices”. Withdrawal of the anticipation rejection to claims 1-2 is respectfully requested.

With respect to independent claim 3, “the cross sectional area of each opening of the multiple entry annular openings is a fraction of an area required for a given mill output [e.g., the prior art], the fractional area of each opening of the multiple entry annular openings being derived by dividing the area required for the given mill output by the number of entry annular openings proposed.” As argued above, Hardinge simply discloses two inlets. There is no disclosure in Hardinge concerning the cross-sectional area, nor is there any disclosure or teaching of a fractional area of single entry annular opening, as taught by the present application and recited in the claims as a fractional area of a given mill output. Accordingly, Hardinge does not disclose each and every feature of the claim, but relies upon assumptions. Withdrawal of the anticipation to claim 3 is respectfully requested.

Claim 9 of the present application requires an air mill having an inlet and a partition where the partition splits entry of the primary air into two streams of air. Nowhere does Hardinge disclose a partition that splits primary air entering the air mill so that half of the primary air enters the interior of the air mill at a first opening and the remaining primary air enters a duct leading to a second opening as required by independent claim 9. There is no disclosure of bifurcated or branched air, simply “inlet ports such as openings 78 near base 10” (column 8, lines 6-7 of Hardinge). Consequently, Hardinge cannot anticipate independent claim 9 because it fails to disclose an inlet with a partition and a duct where the partition separates a primary air flow so that half of the air flow goes to a first opening into the air mill and the remaining air flow travels down the duct. Withdrawal of the rejection under 35 U.S.C. § 102(b) is respectfully requested.

Claims 6 and 7 were respectively rejected under 35 U.S.C. §103(a) as being unpatentable over Hardinge in view of U.S. Patent No. 5,522,768 to Brodt et al. (hereinafter referred to as Brodt), or U.S. Patent No. 4,705,223 to Dibowski et al. (hereinafter referred to as Dibowski), as explained on page 5 of the Action. These rejections are respectfully traversed.

The Examiner agrees that Hardinge does not disclose the recited blockage. However, it is the Examiner's position that Brodt “discloses an air flowing duct with a blockage or an air flow blocking curve in order to reduce air turbulence (Abstract, lines 8-12)”. The Abstract (lines 8-12) of Brodt is reproduced as follows: “The supply air inlet is longitudinally displaced from the supply air outlet and is separated therefrom by a flow turbulence reducing straight duct section”. Brodt states that the turbulence is reduced by

separating the air inlet and outlet by a straight duct section. That is, “longitudinally displaced” in Brodt is equal to separation in distance between the supply air inlet to a supply air outlet in a duct for the same stream of fluid. Whereas, in the present application claim, the primary airflow is separated into two streams to avoid turbulence. The mixing of the two streams of flow in the same direction is achieved in the present application by introducing a blockage, which does the job of an air direction vane. Brodt does not mention any blockage directing the two streams of air to flow in the same general direction after mixing as recited in claim 6. Thus, in addition to the features missing above from claim 9, the blockage of claim 6 is not taught by Brodt. Brodt’s teachings have no relevance to the recited claim as the devices are two totally different technical systems. Accordingly, one of ordinary skill in the art would not have considered modifying Hardinge with the teachings of Brodt to achieve the invention recited in claim 6. Consequently, there is no motivation to modify Hardinge in view of the teachings of Brodt to provide a blockage for mixing two air flows without turbulence.

Claim 7 adds the feature that the cross section of duct (23) is gradually decreased up to section (27). As argued above, Hardinge may disclose a multiple entry but does not disclose a single inlet bifurcated with two openings one of which is connected by a duct or a multiple of ducts or separate ducts. Hardinge does not disclose the bifurcated single entry arrangement claimed by Applicants.

The secondary reference to Dibowski does not disclose a decreasing cross-section for a duct leading to an opening in order to increase the pressure of inlet air in its text or in the drawing. Dibowski does not provide cross-sectional details sufficient to conclude that it discloses a decreasing cross-section for a duct, without an supporting explanation

so that one of ordinary skill in the art would find such a teaching. In addition, Dibowski does not disclose the purpose of this particular configuration of the duct shown in Figure 1. It is submitted that one of ordinary skill in the art would have difficulty comprehending the basis, on which the Examiner has given his comments saying that Dibowski discloses a reduction in cross-section for increasing of pressure. Further, there is no explanation as to where does the air of Dibowski goes after it enters the duct. From Figure 1, it appears that it enters radially into the mill. Then, why would Dibowski require an increase in pressure in the radial duct that is shown in Fig.1? Dibowski in its entirety does not provide any answer to these questions. Hence, claim 7 is not rendered unpatentable under 35 U.S.C. § 103 in view of any combination of Hardinge and Dibowski.

In view of the foregoing comments distinguishing the claimed invention from the prior art of record, it is believed that claims 1-3, 6-7 and 9 are allowable over the prior art of record and Applicants request withdrawal of the above rejections. Withdrawn claim 4 should be rejoined as claim 3 is generic. Accordingly, it is respectfully requested that a Notice of Allowance be issued indicating that claims 1-4, 6-7 and 9 are allowed over the prior art of record.

Should the Examiner believe that a conference would advance the prosecution of this application, the Examiner is encouraged to telephone the undersigned counsel to arrange such a conference.

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Respectfully submitted,



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